Sustainability Roadmap 2018-2019:

Climate Change Adaptation

Progress Report and Plan for Meeting the Governor's Sustainability Goals for California State Agencies

California Conservation Corps

Edmund G. Brown Jr., Governor

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California Conservation Corps Sustainability Road Map 2018-2019: Climate Change Adaptation

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Acronyms

AB	Assembly Bill
EHT	Extreme Heat Threshold
EO	Executive Order
GCM	Global Circulation Model
GHG	Greenhouse Gas
RCP	Representative Concentration Pathway
SB	Senate Bill

EXECUTIVE SUMMARY

The California Conservation Corps (CCC) is comprised of young adults, ages 18 to 25 (and veterans to age 29), who work on conservation projects on public lands in cities and rural areas. Projects range from restoring fish and wildlife habitat, to installing energy and water-efficient improvements, building trails, and improving forest health. As one of the state's emergency work forces, the CCC responds to fires, floods, pest infestations, earthquakes and oil spills.

The CCC currently owns and leases 26 facilities in urban and rural areas - statewide, including eight residential facilities, 18 non-residential facilities comprising approximately 590,000 square feet of building space. The CCC has about 1,434 full-time corpsmembers, of which approximately 584 are housed in residential centers. A typical residential facility includes dormitories, administration, educational, recreational, warehouse, dining, and kitchen space and house 80 to 100 corpsmembers. Residential facilities operate 24 hours a day, seven days a week. The non-residential facility includes educational and administrative space which serves from 30 to 60 corpsmembers and operates five days a week.

The CCC has made significant first steps in meeting the goals of the Executive Orders by implementing procurement strategies, participating in the Governor's Office, Sustainable Building Work Group, and timely reporting base year and ongoing monitoring of energy, gas water and greenhouse gas (GHG) emissions as required. We have completed water use audits at each residential facility and have implemented reduction measures. Our Camarillo and Delta Center are a 'LEED Certified' facility that is also in the DGS test pilot program for Zero Net Energy (ZNE). Energy audits will be conducted at all CCC owned facilities in calendar year 2019. In addition, we anticipate receiving DGS reports on ZNE options for existing residential centers to meet the "green" goals planned at the CCC within this fiscal year.

Amy Cameron for Bruce Saito

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SUSTAINABILITY GOALS

The Governor has directed California State Agencies to demonstrate sustainable operations and to lead the way by implementing sustainability policies set by the state. Sustainability includes the following general initiatives:

- Greenhouse Gas Emissions Reductions
- Climate Change Adaptation
- Building Energy Efficiency and Conservation
- Indoor Environmental Quality (IEQ)
- Water Efficiency and Conservation
- Monitoring Based Building Commissioning (MBCx)
- Environmentally Preferable Purchasing (EPP)
- Financing for Sustainability
- Zero Emission Vehicle (ZEV) Fleet Purchases
- Electric Vehicle Charging Infrastructure
- Monitoring and Executive Oversight

The Governor has issued numerous executive orders directing sustainable state operations. The order relevant to climate adaptation is:

Executive Order B-30-15

EO B-30-15 declared climate change to be a threat to the well-being, public health, natural resources, economy, and environment of California. It established a new interim statewide greenhouse gas emission reduction target of 40 percent below 1990 levels by 2030, and reaffirms California's intent to reduce greenhouse gas emissions by 80 percent below 1990 levels by 2050. To support these goals, this order requires numerous state agencies to develop plans and programs to reduce emissions. It also directs state agencies to take climate change into account in their planning and investment decisions and employ life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives. State agencies are directed to prioritize investments that both build climate preparedness and reduce GHG emissions, prioritize natural infrastructure, and protect the state's most vulnerable populations.

Legislative Direction

Several pieces of legislation were signed in 2015-16 that codified several elements of the EO. These include the following:

- Assembly Bill (AB) 1482 (Gordon, 2015): Requires that the California Natural Resources Agency (CNRA) update the State's adaptation strategy, Safeguarding California, every three years. Directs State agencies to promote climate adaptation in planning decisions

and ensure that state investments consider climate change impacts, as well as the use of natural systems and natural infrastructure. (Public Resources Code Section 71153)

- Senate Bill (SB) 246 (Wieckowski, 2015): Established the Integrated Climate Adaptation and Resiliency Program within the Governor's Office of Planning and Research to coordinate regional and local efforts with state climate adaptation strategies to adapt to the impacts of climate change. (Public Resources Code Section 71354)
- SB 2800 (Quirk, 2016): Requires State agencies to take the current and future impacts of climate change into planning, designing, building, operating, maintaining, and investing in state infrastructure. CNRA will establish a Climate-Safe Infrastructure Working Group to determine how to integrate climate change impacts into state infrastructure engineering. (Public Resources Code Section 71155)

State Resources and Guidance Documents

California has invested significant resources in understanding the risks of climate change to the State and actions available to respond to and reduce these risks. These include the following:

- **Safeguarding California**: The State's climate adaptation strategy organized by sector. Each sector identifies risks from climate change and actions to reduce those risks.
- **Safeguarding California Implementation Action Plans**: Directed under EO B-30-15, the Implementation Action Plans outline the steps that will be taken in each sector to reduce risks from climate change.
- **Building a Resilient California**: Prepared under direction of EO B-30-15, this document provides a framework for State agencies to integrate climate change into planning and investment, including guidance on data selection and analytical approach.
- **California's Climate Change Assessments**: California has completed three comprehensive assessments of climate change impacts on California. Each assessment has included development of projections of climate impacts on scale that is relevant to State planning (i.e., downscaled climate projections). These data are available through Cal-Adapt, an online data visualization and access tool.

CLIMATE CHANGE ADAPTATION

Executive Order B-30-15 directs State Agencies to integrate climate change into all planning and investment. Planning and investment can include the following:

- Infrastructure and capital outlay projects,
- Grants,
- Development of strategic and functional plans,
- Permitting,
- Purchasing and procurement,
- Guidance development,
- Regulatory activity,
- Outreach, and education.

This report will focus on the first three of these activities, and follows the guidance created by the Technical Advisory Group developed under EO B-30-15 to assist State Agencies to complete this task.

Climate Change Risks to Facilities

For all infrastructure, it is important to assess the risk that a changing climate poses to an asset or project (e.g., sea level rise or increasing daily temperatures). It is also important to recognize the impact that an infrastructure project has the surrounding community and the impacts on individual and community resilience (e.g., heat island impacts).

An evaluation of facility vulnerability due to climate change would be performed for any given project or plan for existing infrastructure. Potential project ramifications and requirements would be discussed during the evaluation and preliminary concept phase. During evaluation, the CCC Administrative Division, Sustainability Program, would meet with internal and external stakeholders as appropriate to consider the following screening questions:

1. What is the lifetime of the facility, planned project or plan?
2. Could it be affected by changing average climate conditions or increases in extreme events over its lifetime?
3. What is the consequence of that disruption?
4. Will that disruption affect vulnerable populations, critical natural systems, critical infrastructure, or other assets?
5. Will that disruption cause irreversible effects or pose an unacceptable risk to public health and safety?

The CCC facilities consist of a mixture of state-owned campuses and leased satellite locations. Lifespan of CCC facilities vary widely from 50 years for a new state-owned facility, to a variable period with short-term lease, based on our program or mission needs.

The CCC Administrative Division, Facilities Unit - Sustainability Program, as the main coordination point and program lead on sustainability, will implement this screening process. No formal screening process has been initiated; however, all future CCC facility projects, conceptual, new, and existing, will be subject to the screening process and questions.

The Department of General Services (DGS), Project Management Branch, is the real estate, planning, design, and delivery arm for the CCC on the leasing, acquisition, and development of state-owned facility projects. The CCC, in conjunction with the DGS, currently evaluates those projects for sustainability in general during the planning and design phase.

During the screening process, questions 1 through 5 will be applied to each new and existing (renovation, deferred maintenance) facility project. The answers to those questions, in conjunction with information gathered from Cal-Adapt, GovOps/OTech, and other global circulation models, will help identify critical natural systems, critical infrastructure, and other facility components that require special consideration in the design and construction of each project. The screening process will also give rise to examining possible project localities, materials, methods, and design features to be incorporated, increasing the resilience of the CCC program and facilities against changing climate. Addressing systems and components prior to implementation will help to alleviate possible disruption to vulnerable populations, the environment, and avoid possible risk to public health and safety.

Understanding Climate Risk to Existing Facilities

Risk from Increasing Temperatures

Under a changing climate, temperatures are expected to increase – both at the high and low end. As a result, facilities will experience higher maximum temperatures and increased minimum temperatures. Cal-Adapt, the most updated source of climate change data, and Global Circulation Models (GCMs) data bases, were used to identify facility locations that will experience the largest change in temperature, those facilities that serve specific populations/area, and those whose operations are most critical.

Table 1: Top 5 Facilities Most Affected by Changing Temperature

Facility Name	Annual Mean Maximum Temperature (1961 – 1990)	Annual Mean Maximum Temperature (2031 – 2060)	Annual Mean Max T (2070-2099)	Annual Mean Minimum Temperature (1961 – 1990)	Annual Mean Minimum Temperature (2031 – 2060)	Annual Mean Min T (2070-2099
Chico Satellite	75.4	80.5	84.5	48.4	53.2	57.2
Greenwood Center	71.5	76.6	80.7	47.9	52.1	56.2
Placer Center	72.0	77.0	81.1	47.3	52.1	56.2
Siskiyou Satellite	65.2	70.7	75.4	35.9	40.5	45.1
Tahoe Center	57.1	62.9	67.2	28.0	33.2	37.6

Facilities identified in Table 1 were selected based on the largest change in temperature from mid-century and end of century forecast.

In addition to changing average temperatures, climate change will increase the number of extreme heat events across the State. Extreme events are likely to be experienced earlier than changes in average temperatures.

Table 2: Five Facilities that Will Experience the Largest Increase in Extreme Heat Events

Facility Name	Extreme heat threshold (EHT)	Average number of days above EHT (1961-1990)	Average number of days above EHT (2031-2060)	Increase in number of days above EHT by mid-century	Avg. # days above EHT (2070-2099)	Increase in Avg. # days above EHT by end of century
Fresno Satellite	106.1	4.2	30	26	57	53
Greenwood Center	101.1	4.2	29	25	58	54
Placer Center	100.7	4.3	29	25	58	54
Siskiyou Satellite	99.6	4.3	26	22	61	57
Tahoe Center	86.4	4.3	27	23	58	54

Facilities identified in Table 2 were selected based on the greatest increase in number of extreme heat days above the Extreme Heat Threshold (EHT).

Choosing facilities based on criticality of operations is not an option, as all CCC facilities provide equal critical relief and work together to provide restoration to California's environment in response to disasters statewide and occasionally at the national level. Each CCC facility serves specific target population of young men and women of aged 18-25 (up to 29 for Veterans), who come from all ethnic groups and educational backgrounds. Services of the CCC and these young Corpsmembers benefit California and the world at large. The CCC program workforce consist of two populations: 1) office and support staff, and 2) field staff and Corpsmembers. Notwithstanding the location of each facility, climate change planning activities are required at all facilities.

The climate and temperature affect all aspects of the facility from the following: natural and green infrastructure that provide protection from the weather and outdoor elements for humans and facilities; hard and softscape surfacing that contribute to heat islands, thermal mass storage, and surface water mitigation; building shell and envelop systems that protect and buffer from fluctuations in temperature; building heating, ventilation, and air conditioning systems for health, safety, and human comfort needs; lighting which impacts energy use and heat generation; sizing of building utility systems and the separation of facility generated waste from environmental and storm drain water flows; and sensitive communication systems and heat extremes. Changing temperature also affects occupants' health and safety, as extreme temperatures may require closed buildings with little fresh air exchange, a factor in indoor air

quality, and may contribute to the spread of airborne diseases. Consideration of contraction and expansion coefficients of building materials must be taken into consideration, as weakened building joints and surfaces, open facility structures and systems to premature and costly failure due to air and water infiltration.

To reduce the impact of changing temperature and extreme heat on the performance of new and existing facilities, and to protect occupants' health and safety, the CCC will plan as appropriate, provided funds are available, climate mitigating systems and structures. Some of these systems and structures may include an increase in additional HVAC capacity, increase capacity of drainage systems, implementation of shade structures and solar canopies, planting shade trees, green roofs, bioswales, raingardens, cool roof technology, avoidance of contributing to heat islands, inclusion of thermal heat mass structures, and design attributes that will protect the environment, facility, and occupants. The CCC will review and follow the Safeguarding California Implementation Action Plan for appropriate sectors, and Preparing California for Extreme Heat: Guidance and Recommendations. The CCC currently provides shade structures, water, and toilets for staff and Corpsmembers who are located out in the field. Where the useful lifetime or location of a facility is 5 years or less, changing weather conditions might not be considered into the design to accommodate changing weather conditions.

Using CalAdapt information with engineering standards, in light of forecast for worst case scenarios, will lend to design of appropriate measures, which will then be incorporated into building design, green and natural infrastructures. Building design features to mitigate increasing heat and extreme weather conditions will have a direct impact on actual facility operations and maintenance cost. Upon occupancy of new buildings, performance benchmarking protocols and data can then be implemented to measure actual building performance. It is the goal of the CCC to also apply benchmarking protocols to existing buildings to assist in identifying vulnerable building systems where future improvements can be made.

Risks from Changes in Precipitation

The impacts of climate change on the amount of precipitation that California will receive in the future are slightly less certain than the impacts on temperature. However, it is expected that California will maintain its Mediterranean climate pattern (dry summers and wet winters), but more precipitation will fall as rain than as snow. Larger rains can result in flooding, but will also result in shifts in runoff timing (earlier) and runoff volumes (higher). It will also result in decreased snowpack.

Table 3: Facilities that Will be Most Impacted by Projected Changes in Precipitation

Facility Name	Annual Mean Maximum Precipitation (1961 – 1990)	Annual Mean Precipitation (2031 – 2060)	Percent Change by mid-century	Annual Mean Precipitation (2070 – 2099)	Percent change by end of century
HQ – Sacramento Satellite	18.7"	21.7"	16.0%	23.5"	25.7%
Chico Satellite	22.2"	25.2"	13.5%	27.2"	22.5%
Stockton Satellite	14.1"	16.3"	15.6%	17.4"	23.4%
Tahoe Center	27.5"	31.3"	13.8%	33.7"	22.5%
Ukiah Center	38.0"	43.6"	14.7%	46.6"	22.6%

The facilities identified in Table 3 consist of state-owned and leased facilities. These facilities also show the largest increase in precipitation projections from early century to end of century using the CalAdapt program.

In a general comparison of precipitation from early century, middle century, and end of century, precipitation continues to increase as indicated in Table 3. To protect occupant health and provide safe working environment, consideration will need to be given to building materials, building envelop integrity, and overall interior and exterior moisture controls to avoid mold and maintain building and structural integrity. Soil erosion and settlement, building foundation, drainage, and geotechnical issues require serious consideration in the planning and design phase of new and existing facility projects.

Strategies that the CCC may employ to reduce the impact of changing precipitation on facility performance and to protect occupant health and safety include incorporation of rain water capture systems, natural infrastructure as earth berms and sub-catchment drainage areas, bioswales, raingardens, designing for increased surface water drainage and sewer systems, and leasing space outside of flood risk areas.

Currently there are no projects planned or in place to address flood risk at facilities listed in Table 3. However future projects to incorporate these types of systems and structures will be developed by the CCC Facilities Unit, in conjunction with organizational stakeholders, provided that staff and funding are available to develop and manage the projects. Projects will be prioritized based on guidelines outlined in the *"Planning and Investing For a Resilient California – A Guidebook for State Agencies"*.

Risks from Sea Level Rise

Increasing global temperatures are contributing to rising sea levels. Rising sea levels will result in inundation of coastal areas and increased flooding due to storm surges. The California Ocean Protection Council (OPC) has issued guidance for State agencies on what level of sea level

rise to consider. The Guidance document provides the following estimates of sea level rise for the California Coast, which are based on a study by the National Academy of Sciences:

Time Period	North of Cape Mendocino	South of Cape Mendocino
2000 - 2030	-4 to 23 cm (-0.13 to 0.75 ft)	4 to 30 cm (0.13 to 0.98 ft)
2000 - 2050	-3 to 48 cm (-0.1 to 1.57 ft)	12 to 61 cm (0.39 to 2.0 ft)
2000 - 2100	10 to 143 cm (0.3 to 4.69 ft)	42 to 167 cm (1.38 to 5.48 ft)

An accompanying OPC resolution recommends that departments base analyses on estimates of sea level rise in the upper two-thirds of the range.

Several tools are available to visualize rising sea levels. Cal-Adapt provides information for the San Francisco Bay and Sacramento-San Joaquin Delta. CoSMoS, a model developed by the National Oceanic and Atmospheric Administration, with collaborative tool of Our Coast, Our Future (OCOF), provides data for larger portions of the California coast.

Table 4: Sea Level Rise

Facility Name	Area	Sea Level Rise .0 m	Sea Level Rise .5 m	Sea Level Rise 1.0 m	Sea Level Rise 1.41 m
San Diego Center	California Coast	No Risk	No Risk	1.01-1.5	1.51-2.00

Table figures indicate maximum inundation depth during a likely 100-year storm.

Using the CoSMoS, OCOF interactive maps, the CCC San Diego facility above shows at risk from rising sea levels at a rise above 0.5 meters. This information provides the CCC valuable information in facility logistics planning, and preparation for extreme weather events. The San Diego Center is a leased facility and can be relocated as necessary. The San Diego Center has been leased in this location since 2011 with key consideration on corpsmember population. The CCC will take changing climate and corpsmember population movement into consideration when planning any future move of the San Diego Center.

Actions that could be taken to minimize the risk of rising sea levels, until an actual facility move can occur, may include relocation of information technology facilities, ventilation systems, and warehouses; as well as flood protection through designing of green infrastructure, sub-catchment drainage areas, earth berm structures, and ultimately relocation of facilities out of low lying areas as necessary.

Considering the location of current and planned facilities relative to the current coastal zone and risks of flowing and inundation, major exposure to catastrophic events are not foreseen. However, uncertainties may arise from the inherent unpredictability of natural climate variation, a combination of sea-level rise, possible changes in storm climate, and tectonic uplift or subsidence.

Natural Infrastructure to Protect Existing Facilities

EO B-30-15 directs State agencies to prioritize the use of natural and green infrastructure solutions. Natural infrastructure is the "preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but need not be limited to, flood plain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days" (Public Resource Code Section 71154(c)(3)).

The CCC program is dedicated to the direct conservation and enhancement of the state's natural resources through hands-on restoration projects. The CCC Watershed Stewards Project links education with high-quality scientific practices, and involves community residents and students in their outreach activities to promote watershed awareness and education on the use of natural infrastructure. The CCC Salmon Restoration Program, Statewide Trails and Backcountry Trails Program, Clean Energy and Energy Efficiency Program, along with water conservation and fire hazard reduction work, contribute towards the restoration of public lands through fire hazard reduction, woodland and wetland habitat restoration. The CCC provides these services and projects to the state's public lands, as well as in and around the CCC facilities, and elsewhere throughout California and the United States, as needed to preserve, protect, and restore, natural habitats, ecological systems, and infrastructure. These services and projects also mitigate and reduce the effects of climate change, during crisis, and fire events.

Understanding the Potential Impacts of Facilities on Communities

Vulnerable Populations

Certain populations are more susceptible to the effects of changing climate conditions, and will have less capacity to recover from changing average conditions and more frequent and severe extreme events. A number of factors contribute to vulnerability, often in overlapping and synergistic ways. These can include a number of social and economic factors, and be determined by existing environmental, cultural, and institutional arrangements. Vulnerable populations can include, but are not limited to, people living in poverty; people with underlying health conditions; linguistically or socially isolated individuals; communities with less access to healthcare or educational resources; or communities that have suffered historic exclusion or neglect.

Changing climate conditions pose a very real and personal threat to all CCC stakeholders, effecting shelter, food, transportation, fuel, the economy, and communication. Stakeholders include Corpsmembers and their families, CCC staff, CCC sponsors, and CCC facility neighbors. The direct population served by the CCC are the actual Corpsmembers which includes young men and women aged 18 to 25 (up to 29 for Veterans), of all income and education levels, and numerous with young families. Many Corpsmembers coming from disadvantaged backgrounds may not have vehicles in which to evacuate, or means to pay for hotel rooms or lost wages from extreme climate events. Additionally, those Corpsmembers assigned to Residential Centers would be 100 percent dependent upon the CCC for assistance during a disaster. On a daily

basis Corpsmembers are working out in the field, including during times of extreme weather and extreme events - which puts them at high risk of being separated from their families. On another level, the CCC staff and Corpsmembers interact with potentially vulnerable communities with the presence of physical facility locations. During an extreme climate event or disaster, in addition to Corpsmembers, staff and facility neighbors may also require assistance or shelter, with the possibility of being without power, communication, transportation, food and water.

It is in all of these types of situations that the CCC may mitigate potential risk and damage, and provide real time work skills to the Corpsmembers - by developing future training and education programs and various public outreach programs, to help educate all stakeholders on adaptation methods, preparation of plans for future extreme events, and emergency action plans on an organizational and personal level. Through these programs, the CCC contributes to increasing the income and employment outlook of youth and potentially vulnerable community.

Disadvantaged Communities

California is required to invest resources in disadvantaged communities (DACs). DACs are identified using CalEnviroScreeen, a tool that ranks census tracts based on a combination social, economic, and environmental factors. While it does not capture all aspects of climate vulnerability, it is one tool that is available, and does include several relevant characteristics. In many cases, disadvantaged communities are more likely to suffer damage under changing climate conditions, including extreme events. The department's facilities located in these communities can contribute or alleviate the vulnerability of these communities.

Table 5: Facilities located in disadvantaged communities

Facility Name	CalEnviroScreen Score	Is it located in a disadvantaged community? Yes/No
Inland Empire Center	96-100 percentile	Yes, disadvantaged and low-income
San Diego Center	86-90 percentile	Yes, disadvantaged and low-income
Stockton Satellite	96-100 percentile	Yes, disadvantaged and low-income

Approximately 17 percent of the CCC's facilities are located in disadvantaged communities. The CCC interacts with the community and provides services through some of the CCC programs described below.

The AmeriCorps VISTA Program provides VISTA volunteers at CCC HQ to assist with policy and program development at Energy Corps locations throughout the state. The VISTAs develop community partnerships and resources to help in these areas.

The Watershed Stewards Project links education and implementation of practices, involves community residents and students in their outreach activities, and promotes watershed awareness and education on the use of natural infrastructure.

The CCC Weatherization Partnership program started as a Weatherization and Energy-Efficient Rehabilitation (WEER) Program, a partnership between the CCC and the California Community Services Department in 1999, a two-year funded program. Due to its incredible success, the

CCC has continued on with the weatherization program by partnering with the Central Coast Energy Services (CCES), a local non-profit, for more than 20 years. It is in providing weatherization services to low-income families that low-income families can become self-sufficient, while providing CCC Corpsmembers valuable job skill, thus opening doors to new job opportunities.

Experienced Corpsmembers can apply for, and interview with CCES, for internship positions working in the office doing intake and administrative work or working in the field implementing weatherization improvement measures. The Corpsmembers are provided with approximately 900 hours of training on weatherization techniques (i.e. HVAC, window installation, insulation, doors, weather stripping, appliance replacement, etc.) Over the years many of the CCC Corpsmembers have been hired by CCES, now comprising about 50 percent of the CCES staff, some in management positions, and many having worked for CCES more than 15 years. The CCES internship also qualifies CCC Corpsmembers for participation in the AmeriCorps program.

The CCC Energy Corps, consisting of ten crews throughout California are overhauling thousands of light fixtures inside courthouses, courtrooms, and chambers, sponsored by the Judicial Council of California. Energy Corps will be pulling out more than five thousand older light fixtures in the Department of Justice building and replacing them with more energy efficient LED lamps and ballasts. These projects provide Corpsmembers with experience translating into employment opportunities with energy companies, while also saving the state money within just a few years.

A goal of the CCC training and education program is to have Corpsmembers enter the working world with the education and work ethics they need to be successful. Corpsmembers participate in a standard academic assessment which helps staff determine the educational needs of each Corpsmember. Approximately 30 percent of the members join the CCC without a high school diploma or high school equivalency certificate. Corpsmembers without a high school diploma are required to attend high school for a minimum of 10 hours a week after the workday. These Corpsmembers are enrolled in an onsite charter high school program. Corpsmembers who possess a valid high school diploma are also expected to advance their education, and are required to attend educational courses for a minimum of three hours a week after the workday. Adult basic education and general college courses are made available to these members as well.

Through CCC's development and promotion of mitigation and adaptation policies, education and public awareness in natural and green infrastructure solutions, programs for improving energy and weatherization measures (as those described above), incorporation of programs that provide health co-benefits and adaptive capacity (e.g. active transportation biking programs to reduce the burden of cardiovascular disease and diabetes), urban greening, providing energy-efficient housing and office environments, sustainable forestry programs, and consumption of locally-grown produce - will help build resilience to environmental threats to human health, and provide for a more robust economy, changing climate, and extreme heat response.

It should be noted that active transport and low-carbon driving could be explored, if feasible, to achieve emissions reductions sufficient for CCC to help meet legislative mandates.

Urban Heat Islands

Urban heat islands are areas with localized spikes in temperature, which impact human health, increase pollution, and increase energy demand. Urban heat islands occur during the hot summer months in areas with higher percentages of impervious surface and less vegetation. This is likely in areas with large parking lots, dense development, and lower tree density and shading. Urban heat islands can be mitigated (i.e., reduced) through tree planting and other greening measures, cool roofs (e.g., lighter roofing materials that reflect light), cooler pavements, and other measures.

Table 6: Facilities Located in Urban Heat Islands

Facility Name	Located in an urban heat island (yes/no)
AmeriCorps Watershed Stewards	No
HQ - Sacramento Satellite	Yes
Camarillo Center	No
Chico Satellite	No
Fortuna Center	No
Fresno Satellite	Yes
Greenwood Center	No
Inland Empire Center	No
Vista Satellite	Yes
Placer Center	No
Redding Center	No
San Diego Center	Yes
Santa Maria Satellite	No
Siskiyou Satellite	No
Stockton Satellite	Yes
Tahoe Center	No
Ukiah Center	No

Approximately 28 percent of the CCC's facilities are located in Urban Heat Islands.

While these facilities do include parking lots for CCC fleet vehicles, staff and Corpsmember parking, the parking lots are not excess in size. Planning for future facilities will include measures to reduce impermeable surface areas surrounding the facility, and include additional greening, planting of trees for shading, utilizing cool roofs in upcoming re-roof projects, and using high reflectance slurry seals in upcoming parking lot slurry seal projects. The DGS has taken urban heat island into account in the planning of the CCC's Delta Center Project which will be located just outside Stockton.

Understanding Climate Risk to Planned Facilities

Table 7: Climate Risks to New Facilities

Facility Name	Annual Mean Maximum Temperature (1961 - 1990)	Annual Mean Maximum Temperature (2031 - 2060)	Annual Mean Minimum Temperature (1961 - 1990)	Annual Mean Minimum Temperature (2031 - 2060)	Annual Mean Maximum Precipitation (1961 - 1990)	Annual Mean Precipitation (2031 - 2060)
Delta Center	74.2	78.9	48.1	52.3	13.7"	15.7"

Table 8: Extreme Heat Events and New Facilities

Facility Name	Extreme heat threshold (EHT)	Average number of days above EHT (1961-1990)	Average number of days above EHT (2031-2060)	Increase in number of days above EHT
Delta Center	103.4	4.3	18	14

The Delta Center consists of the following buildings: four dormitories, administration, education, recreation, multi-purpose (kitchen/dining) and a warehouse. The campus also includes a parking lot, with 55 stalls for staff, corpsmembers and visitors, and a maintenance yard where the state fleet will be stationed. The campus sits on approximately 15 acres with all buildings in a southerly orientation, ideal for future solar panels located on the roofs. The building design includes a stucco exterior, metal roofing, aluminum clad, dual pane windows with low-e film and metal insulated doors. All mechanical systems are designed to meet and exceed T-24.

During the design phase, an extensive 25' wide asphalt fire lane around the campus was converted to compacted crushed rock in order to minimize the heat gain around the dormitory area. Plans are in the works with DGS for a power purchase agreement to add solar panels to the project following completion of construction. In addition to arrays located on the ground, the project will include panels above the parking lot whose shading will also mitigate the heat island effect. The building envelope is well suited for absorbing and dissipating any anticipated heat increases. A lighter color palette will be utilized to reflect solar gain.

Table 9: New Facilities and Disadvantaged Communities and Urban Heat Islands

Facility Name	Located in a Disadvantaged Community (yes/no)	Located in an urban heat island (yes/no)
Delta Center	Yes	Yes

Delta Center is located just outside of Stockton (Stockton is a disadvantaged and urban heat island) within San Joaquin County, in a semi-rural farming area. However, industrial parks are being developed nearby so the CCC is taking proactive steps to reduce its environmental impact in regards to the heat island effect. During the center's useful life, it is anticipated that climate change with have a minor effect on the building envelope and its mechanical systems, provided that a good preventative and predictive maintenance practices are employed.

This project first began about ten years ago, and as such, did not consider climate change during the design phase. However, in the last few years, the CCC and DGS have taken advantage of opportunities to account for climate change whenever possible.

Natural Infrastructure

EO B-30-15 also directs agencies to prioritize natural and green infrastructure solutions. Natural infrastructure is the "preservation or restoration of ecological systems or the utilization of engineered systems that use ecological processes to increase resiliency to climate change, manage other environmental hazards, or both. This may include, but need not be limited to, flood plain and wetlands restoration or preservation, combining levees with restored natural systems to reduce flood risk, and urban tree planting to mitigate high heat days" (Public Resource Code Section 71154(c)(3)).

In prioritizing natural infrastructure of new CCC facility design and operations, priority shall be given to actions and approaches that both build climate preparedness and reduce greenhouse gas emission, secondary consideration will be provided to those actions that protect the state's most vulnerable populations, and lastly, consideration will be given to actions and approaches providing the highest rate of savings. Where possible, actions and approaches shall be developed to provide flexibility and adaptability, to prepare for extreme and uncertain climate impacts.

For our new Delta Center, Natural Infrastructure will be incorporated by mean of landscaping including planting of trees, shrubs and grasses. In addition the property is dissected by wetland that are being preserved and protected and serves as a natural "air conditioner" for the campus.

Full Life Cycle Cost Accounting

EO B-30-15 directs State agencies to employ full life cycle cost accounting in all infrastructure investment. Lifecycle cost accounting includes:

- Considering initial investment costs, as well as lifetime operation and maintenance costs under changing climate conditions, including changing average conditions and increases in extreme events.
- Applying non-market evaluation methods such as travel cost, avoided costs or contingent valuation to capture hard-to-quantify benefits and costs.

The CCC is taking climate change into account on all planning and investment decisions. The CCC hopes to employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives in the planning, design, and delivery of new CCC facilities in the near future.

As capital outlay concepts and budget change proposals are developed for new and existing infrastructure facility projects, the CCC's Five-Year Infrastructure Plan is likewise tailored, taking current and future climate change impacts into account.

Lifecycle considerations in new CCC facility design and operation will include in addition to the two considerations listed above, a number of factors and decision points in order to optimize

sustainability, performance and cost-control. Below are some of the considerations that the CCC will evaluate in terms of facility life-cycle performance and decision-making:

- Utility and Energy Costs
- Annual Preventive Maintenance Costs
- Major Repair & Replacement Cost
- First Costs (capital and finance)
- Capital Renewal Cost
- Facility Renovations or Upgrades
- Risk Management
- Performance Benchmarks
- Sustainability and Carbon Footprint Benchmarks
- Desire to achieve net-zero energy use

Adaptive and creative facility and system designs, and equipment, may at times have slightly higher first costs, but will return substantial savings at a rate many times the original investment. Life cycle evaluation of CCC building systems, direct and indirect financial, operating cost, operational and environmental impacts, including energy, design, and equipment decisions, operations/maintenance, staffing, repairs and replacements will provide a comprehensive understanding of potential options and impacts over the long-term ownership of the facility. Development of benchmarks, and performance targets will allow CCC to better forecast the impact of costs for large-scale systems, individual components, and operations and maintenance costs.

Life cycle evaluation, development of baseline and benchmarks (already in progress through the Energy Star Portfolio program), and performance targets will continue to be coordinated through the CCC Administrative Division, Facilities Unit - Sustainability Program, dependent upon staffing resources and funding availability. In addition to Roadmap Facility Worksheets, the goal of the CCC would be to develop CCC policy on baselines, benchmark and performance targets for CCC state-owned facilities, and key leased facilities. This information would be used to track facility energy consumption and reduction, facility management, and used to evaluate the need for facility improvements.

Integrating Climate Change into Department Planning and Funding Programs

Table 10: Integration of Climate Change into Department Planning

Plan	Have you integrated climate?	If no, when will it be integrated?	If yes, how has it been integrated?
New and Existing Facilities	Yes Limited	August 2018	In the design process for new and existing facilities
CCC Project Work	Yes Limited	November 1, 2018	Departmental Policy

Table 11: Engagement and Planning Processes

Plan	Does this plan consider impacts on vulnerable populations?	Does this plan include coordination with local and regional agencies?	Does this plan prioritize natural and green infrastructure?
New and Existing Facilities	Yes it will	Yes, as applicable	Yes it will
CCC Project Work	Yes it will	Yes, as applicable	Yes it will

The CCC will consider applying for direct grants, proposition funding, local assistance programs, and other funding programs depending upon available resources.

Measuring and Tracking Progress

One of the biggest concerns of climate impacts on the CCC is the cost to address actions and approaches to mitigate and prepare for changing climate and extreme weather conditions. Cost for planning and implementation to address human resource health and safety issues; extended community outreach; hard and soft cost of facility planning, operations and maintenance; travel and training; and life cycle processes of planning, analysis and evaluation. These costs cannot be absorbed within existing resources; thus the department will need its budget augmented accordingly.

The CCC is in the process of developing a Sustainability Program to keep track of progress on climate impact and sustainability milestones and goals. The CCC Sustainability Program will address all facets of program development to address sustainability methods and approaches, facility and program implementation; development, management and implementation of life cycle facility studies, including the incorporation of findings and methods into projects and programs; development of performance benchmarking protocols, tracking processes and systems which will help the CCC track increased resilience and overall progress in integrating climate change into planning and investment.

Incorporating flexibility and adaptability into longer term planning will help the CCC prepare for projected impacts of climate change, reduce future financial impacts program and facility cost, and provide increased resiliency in environmental response. Flexibility and adaptability

may be accomplished by maximizing energy and water efficiency in buildings, designing and locating buildings in ways that take advantage of the sun and natural ventilation, utilization of landscaping to increase summer shading and minimize air conditioning use, reducing the urban heat island effect by planting trees and incorporating reflective roofs and light-colored pavement, designing buildings to be more durable and to withstand more intense storm events, incorporating storm water management strategies such as green roofs, bioswales and raingardens.

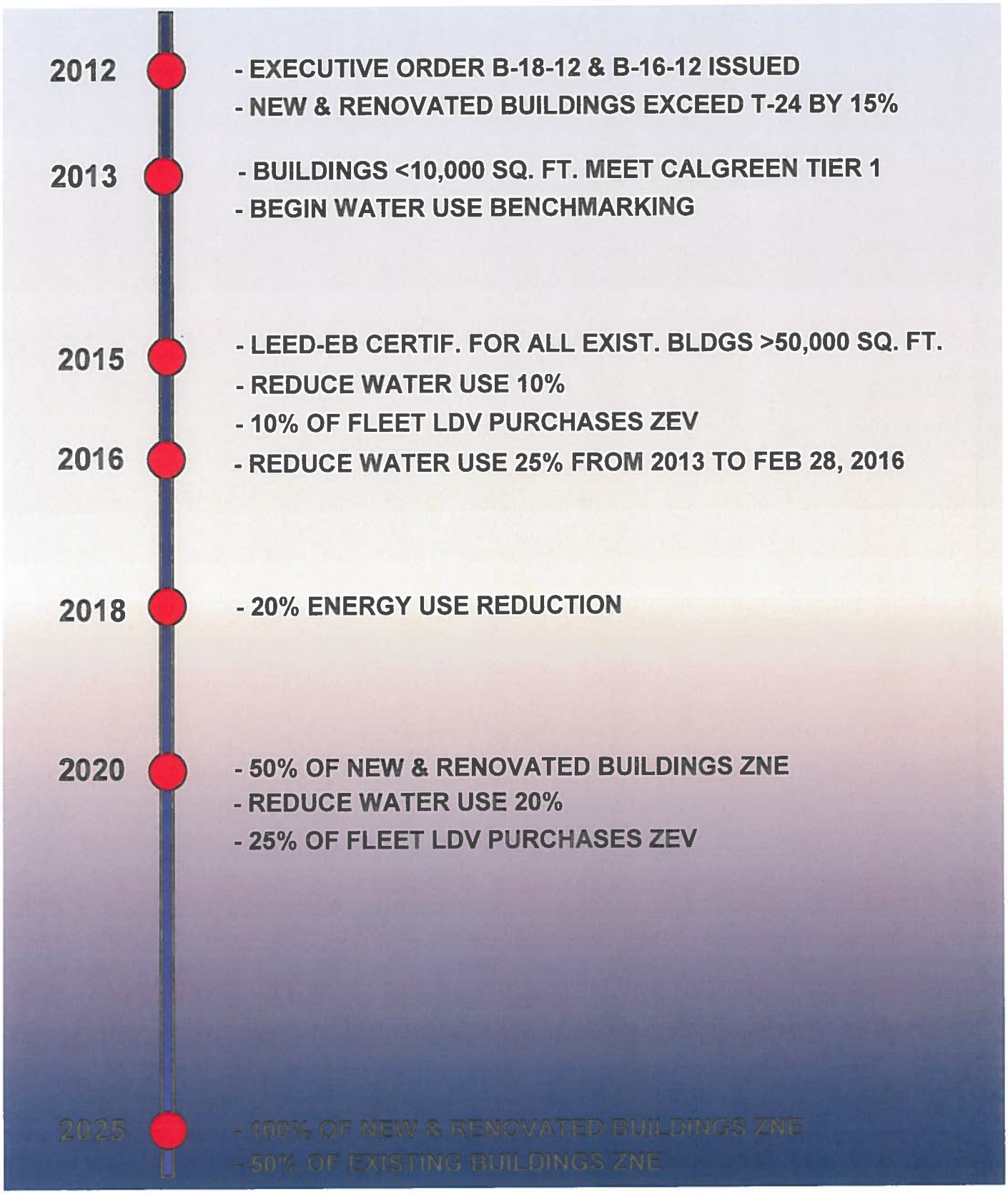
For each new CCC investment, the following steps will be to build the cost of sustainability and adaptation into the cost of each new capital project:

- Risk assessment to changing climate using CalAdapt, and other models identified in this report;
- Identify the impact that an infrastructure project has on surrounding community and the impacts on individual and community resilience.
- Apply the screening process and questions, as posed in "Climate Change Risks to Facilities" section.
- Develop a strategy list, incorporating flexibility and adaptability, relative cost and benefits of action.
- Obtain input and consensus by internal stakeholders.
- Develop benchmark targets and measures.
- Identify and obtain funding via application for direct grants, proposition funding, local assistance programs, and other funding programs.

The CCC Sustainability Program, housed within the CCC Administrative Division, Facilities Unit will develop policy to integrate climate change into all infrastructure investment. The policy is anticipated to be completed by November 1, 2018, with the policy being integrated in all infrastructure investment through the CCC's Five-Year Infrastructure Plan.

The CCC Sustainability Program will identify and prioritize natural and green infrastructure options based on actions and approaches that both build climate preparedness and reduce greenhouse gas emission, secondary consideration will be provided to those actions that protect the state's most vulnerable populations, and lastly, consideration will be given to actions and approaches providing the highest rate of savings.

SUSTAINABILITY MILESTONES & TIMELINE



DEPARTMENT STAKEHOLDERS

Understanding Climate Risk at Existing Facilities	
Amy Cameron	Chief Deputy Director, Executive Office
Dawne Bortolazzo	Deputy Director, Administrative Division
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit

Understanding Climate Risk at Planned Facilities	
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Integrating Climate Change into Department Planning and Funding Programs	
Amy Cameron	Chief Deputy Director, Executive Office
Dawne Bortolazzo	Deputy Director, Administrative Division
Steven Fultz	Departmental Construction and Maintenance Supervisor, Facilities Unit

Measuring and Tracking Progress	
Amy Cameron	Chief Deputy Director, Executive Office
Dawne Bortolazzo	Deputy Director, Administrative Division
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